

**Preparing The Community for the Collapse of Basic Infrastructure during
Local Disasters**

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CERTIFICATION STATEMENT

I hereby certify that the following statements are true:

1. This paper constitutes my own product, that where the language of others is set forth, quotation marks so indicate, and that appropriate credit is given where I have used the language, ideas, expressions, or writings of another.

2. I have affirmed the use of proper spelling and grammar in this document by using the spell and grammar check functions of a word processing software program and correcting the errors as suggested by the program.

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ABSTRACT

Since local disasters can wreak havoc on both the local community and local fire department resulting in a collapse of basic infrastructure, this descriptive research identified the strategies and preparations that a fire department and community can achieve.

Research questions were:

1. What steps can be taken ahead of time to prepare for the collapse of basic infrastructure in the community for an extended period of time?
2. How can the Blue Ash Fire Department direct the residents and individual fire department members to prepare for a catastrophic event?
3. What have other fire departments done to direct the residents and individual fire department members in this regard?
4. During and after such an event, what steps can be taken to reduce the potential loss of life and the negative impact on the community?

Procedures followed included literature research, an interview, and surveys.

Results indicated that most in the community were unprepared for a local disaster, and were not informed as to how to prepare.

Recommendations include; dissemination of disaster preparedness materials from the fire department to the local community through educational seminars, mailed fliers, and Community Emergency Response Team; (CERT), Federal Emergency Management Agency; (FEMA), National Fire Prevention Agency; (NFPA) and National Organization for Victim Assistance; (NOVA) classes.

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INTRODUCTION

Statement of the Problem

Although the Blue Ash Fire Department does have a disaster preparedness plan, *the problem this study addressed was:* The need for a department to help prepare the citizens for local disasters. Local disasters such as tornadoes or ice storms can result in the loss of basic infrastructures within the community. Residents of the community may not be prepared for such situations, and a possible result is havoc. If there were inadequate specific preparations or preplans for this type of event on the part of the public, due in part to a lack of community education by a fire department prior to a disaster, this in turn may increase the time it would take to manage such an “event.”

Purpose of this study

The purpose of this study was to: Identify and describe the strategies and preparations the Blue Ash Fire Department and the community members can make for the collapse of basic infrastructure that may include, but not be limited to electric, water, and natural gas. The departments’ administrative staff and city leaders may use the results of this study to prepare management plans to educate the community regarding the appropriate actions needed to reduce the impact of similar catastrophic events.

Research Questions

The research questions this study investigated were:

- 1.) What steps can be taken ahead of time to prepare for the collapse of basic infrastructure in the community for an extended period of time?
- 2.) How can the Blue Ash Fire Department direct the residents and individual fire department members to prepare for a catastrophic event?

3.) What have other fire departments done to direct the residents and individual fire department members in this regard?

4.) During and after such an event, what steps can be taken to reduce the potential loss of life and the negative impact on the community?

As a result of this descriptive research methodology, a new citizen training program can be developed and implemented.

BACKGROUND AND SIGNIFICANCE

Many fire departments have plans to assist in handling urgent situations on a scale larger than the day-to-day emergencies, and the Blue Ash Fire Department is no different. These contingencies however, rely heavily on mutual aid support from neighboring departments, and in most cases function very well. Should a disaster occur on a regional scale such as a weather related event, in some cases, the resources relied upon via mutual aid are consumed with one's own community.

The Blue Ash Fire Department uses the City's Disaster Plan that contains contingencies for "events" that tax the resources of the Fire Department and mutual aid support by neighboring departments. During such "events", the community would need to be better informed and prepared to manage emergencies until other fire departments and public safety agencies could arrive.

In February 2007, a snow and ice storm disaster resulted in widespread electrical outages that lasted hours, and in some communities, days. This incident resulted in several serious circumstances during blizzard like conditions such as: Loss of heat, lights, and refrigeration, as well as tree limbs falling onto houses, vehicles and into yards due to heavy ice accumulations, (in one case killing a young girl in a neighboring community.) Many persons in the community had to seek shelter other than their own residence due to the inability to keep warm. (The Blue Ash Fire Department became an emergency shelter.) Some persons throughout the tri-state lost hundreds of dollars in food due to lack

of refrigeration. Persons with certain medical needs were affected; i.e. could not refrigerate medications, or even get to a pharmacy. Although an approximate four day warning of the approaching storm was given through local media; i.e. television and radio, and the pre-warning time appeared to be sufficient, the community apparently was unaware of exactly what was needed to be prepared for such a disaster. This was in part due to lack of proper dissemination of information on disaster preparedness to the community from the fire department.

During a severe tornado that ripped through the local area during the early morning hours in April 1999, two deaths occurred in a neighboring community; once again perhaps due to lack of proper preparation. Since the outdoor warning sirens could not be heard by the couple while sleeping inside the residence, it was latter noted by local authorities that if the residents had owned and operated a NOAA Weather Radio System, lives may have been spared by being alerted of the approaching danger. These are serious problems that need to be addressed, because most likely there will be future local disasters in our area.

The significance of this study could ultimately save lives if the community was better educated and a more detailed plan for disaster preparedness was in place. *The potential impact this study could have on the Blue Ash Fire Department is:* Improved preparedness, organization, and peace of mind for both the community and fire department during any future disaster events.

LITERATURE REVIEW

On the subject of citizen preparedness, history shows that natural or human-made disasters can occur at any time in neighborhoods, schools, or places of employment. Therefore, community members may need to make quick decisions to access basic necessities such as food, water, shelter and communication. A major lesson learned from studies of past disasters is that the disasters take a major toll on basic government services, and that it could take hours, or days for outside relief to arrive. It is

important for families to take steps to prepare in advance for such emergencies and disasters.

The National Center for Disaster Preparedness, (NCDP) (n.d.)

Truisms about emergency planning include the facts that citizens do not like to think about the negative consequences of potential disasters. “This state of mind tends to inhibit a spirit of preparedness.” Perry & Lindell, (2003).

One common cold weather problem involving citizens attempting to survive several winter days without electricity or heat is hypothermia. Hypothermia is the general cooling of the body core when more heat is lost than is produced. Studies show that children and adolescents lose heat faster than adults because body surface area is large in proportion to their weight, and there is generally less subcutaneous fat. American Academy of Orthopaedic Surgeons & Wilderness Medical Society, (2005).

According to FEMA the main steps to help citizens prepare for disasters are; to get informed by learning what possible hazards are local to one’s community, and make a plan to respond to any disasters that could occur in one’s area. It is also necessary to know how to evacuate and to have a family communication plan in place. It can also be beneficial; to assemble a disaster supplies kit, and store food and water. Citizens should maintain a plan, practice a plan, keep supplies up to date, and in good condition. FEMA, (2004)

Hall, (2005) writes about a non-profit Council for Excellence in Government that developed a Public Readiness Index as part of a report. The report rated people’s preparedness on a one-to-ten scale based on answers to ten questions. The average index score was only 3.31. The questions ranged from whether people know about the communities’ disaster plan and how to find the emergency broadcasting channel on the radio, to whether a home disaster kit and family meeting plan had been put in place. The report also found in part that people 65 and older were less likely to be prepared than others, and that people with higher education and income levels were also less likely to be prepared.

In a similar study conducted by Phillips, Metz, & Nieves, (2005) it was revealed that lower income persons were less likely to be prepared for disasters. Phillips, et al. survey can be found in appendix number 13.

Matsuda & Okada, (2006) note that the Kobe earthquake taught people that the impact of a catastrophic disaster would exceed the capacity of the local public rescue services, therefore citizens would need sufficient knowledge and preparation, instead of relying completely on public services. A social trend that appeared to take place after the earthquake was that many neighborhood communities autonomously started taking proactive measures to enhance preparedness. The authors' stated that motivation for self-help community activity arises from various opportunities, such as discussion of residents, and collaboration with different community associations. Local knowledge is important for community disaster preparedness mainly because the end-victims of a disaster are none other than the people in a community, and are eventually responsible for one's own survival and saving one's property.

In one study, within months of September 11, 2001, Redlener, (2006) found that "...few Americans have complied with recommendations made by a number of organizations promoting basic, prudent steps to ensure their safety in the event of a mega disaster." (p. 181). Comprehensive surveys were developed that covered a number of issues, from concerns about further attacks, to how confident people were that government agencies could respond to disasters in general. Some of the most common responses to the survey were; 1). "It's not very likely that anything will really happen, and if it does, it won't happen to me." 2). "I'll just call 911." and 3). "I don't know what to do."

Redlener found that although surveys show the public is concerned about the potential for future disasters, the awareness does not seem to translate into preparedness planning. Redlener also found that the general public needed to understand its own critical role in disasters. Regarding another study, Redlener asked David Berman, a senior policy analyst at Columbia's National Center for Disaster Preparedness, to look into the question; "Have Americans ever responded to preparedness

messages?” His findings from a Gallup survey found that after Pearl Harbor and at the beginning of World War II, when asked if they knew where to go in the event of an air raid, 35% of the persons polled gave a correct answer, 58% said they had not given the question any thought.

Moving onto the subject of terrorism and preparing for mega disasters, the U.S. Department of Justice & FEMA (n.d.), noted that “the threat of terrorism affects all communities both nationally and internationally. History has shown that no community is immune.” (p. SM 1-2). It would therefore be wise for citizens to be prepared to evacuate, or to protect-in-place, (same as shelter-in-place).

Secretary Tom Ridge, U.S. Department of Homeland Security (2003), stated: “Terrorism forces us to make a choice, we can either be afraid, or we can be ready.”

Redlener, (2006) states that no matter what else is done, all citizens need to acquaint themselves with the basic principles of disaster readiness. Developing a family plan for whom will do what in a disaster, stockpiling essentials, and learning about the particular risks that might affect one’s own family or community are important steps. (p. 235).

The main points relevant to being prepared for a collapse of basic infrastructure in the community, are to get informed, make a plan, assemble a disaster supplies kit, and maintain the plan.

A disaster or emergency could overwhelm the capabilities of a state and local governments in providing a timely and effective response to meet the needs of a situation. Also when considering planning assumptions, a disaster or emergency may cause significant damage to the economic and physical infrastructure. The U.S. Department of Justice & FEMA (n.d.),

Information exchanged interdepartmentally or to citizens during disaster response must be clear, unambiguous, and communicated rapidly. This is a time when pre-emergency practice is likely to enhance the maintenance of clarity while communicating rapidly under conditions of disaster.

Preparedness activities should then include disaster planning, resource gathering, development and maintenance of warning systems, practice exercises, and so on. Gillespie, & Streeter, (1987).

Many programs on disaster preparedness for children are currently in existence. FEMA produces coloring books on disaster preparedness that teach what to do in the event of an earthquake, or other disasters. On line games, tests, and how to assemble an activity survival kit are also included, along with a story book addressing disaster preparedness. FEMA (1993).

The public-at-risk must be involved in the planning process if they are expected to undertake personal protection in an emergency. All citizens should be aware that planning for community disasters is underway, and what is expected of them under the plans. They need to know what is likely to happen in a disaster, and what emergency organizations can and cannot do for them. Therefore the training component of a plan has at least two tiers. One is information aimed at elected officials, and public administrators, commonly referred to as risk communication. Second, information must be geared toward the public, and may include specific training and equipment such as; residents close to a nuclear power plant being given potassium-iodide tablets, and instructed on their use. Such training is usually administered by technical specialists. Perry, et al. (2003).

FEMA's (2004) "Are You Ready?" facilitators guide provides a DVD to conduct a program to prepare the community for a disaster. This guide is a companion to 'Are You Ready?' An In-depth Guide to Citizen Preparedness. The document contains guidelines for making emergency preparedness presentations to the general public through suggested organizations such as civic, religious, and senior citizen groups; volunteer agencies, social clubs, as well as scouts, youth groups, and school districts. (p. 1-1).

A community disaster preparedness course known as, "Get Ready" features information on preparing, promoting, and conducting a successful disaster preparedness presentation for any fire department. John Thomas, emergency coordinator for the city of Hammond Louisiana, stated

regarding Hurricane Katrina, "People were self-sufficient for a day or two, then it got rough." "Having a plan is not necessarily the same as being prepared." (p.3). Katrina knocked out the communications networks of fire departments all along the Gulf Coast; therefore calling 911 was not an option. NFPA (2005)

Hall, (2005) tells of a survey developed by the 'Council for Excellence in Government' that suggests that emergency managers should work through schools and businesses to educate persons in disaster preparedness.

Matsuda & Okada, (2006) relate in a study titled 'Community Diagnosis for Sustainable Disaster Preparedness' that the purpose of preparedness is to anticipate problems in disasters so that methods can be devised to address problems effectively, and so that resources required for an effective response are in place beforehand.

Redlener, (2006) goes on to indicate that past disaster evaluations give us insight into improvements that can be made; such as synchronization of police, fire, emergency medical, and school administration. This he believes can be accomplished by joint planning sessions and frequent drills. His research shows that in many cases there is still a need for uniform radio equipment and emergency services wavelengths for all law enforcement and emergency services.

Matsuda & Okada, (2006) in agreement with Perry, et al., found that disaster preparedness can be sustainable only when knowledge acquisition and appropriate action is repeated continuously until the day a disaster occurs. To be effective, preparedness needs to be managed by incorporating disaster risk management as a part of community management. Also, preparedness cannot be sustained unless knowledge is shared and transferred among the agents. The authors therefore propose a countermeasure, as a kind of knowledge. The first type of knowledge is hazard information. If people do not know of the existence of some risk, there is no motivation to prepare for it. The second type of knowledge is know-how information to survive disasters. An example of this type of knowledge would be to inform citizens where to evacuate in an emergency. This type of knowledge can be

provided by experienced experts or professionals. The third type of knowledge emphasized in the paper is local knowledge provided to the agents by the community. These needs, questions and opinions on disaster preparedness need to be retrieved and processed by the agents.

In *Emergency Medical Services Magazine*, Erich (2007), points out that it is critical to remember that emergency responders may be double or even triple counted among disaster response resources. For example, you may have the full-time medic who is also a volunteer firefighter and a DMAT member. He or she may be counted as three responders in a disaster plan; however he or she is in reality only one responder. This could create an unanticipated shortfall.

Regarding public education, this same author goes on by encouraging departments to help citizens educate themselves. The department should offer as much information as possible about emergency supplies and basic first aid.

The Blue Ash Fire Department can have a part in preparing citizens in the community for local disasters by surveying the community, and implementing and disseminating classes and materials provided through FEMA, NFPA, and American Red Cross. The department members can be better prepared by synchronizing emergency responders and community leaders through joint planning sessions.

A cross-sectional survey was used to describe the preparedness of 80 emergency social service organizations in a Midwestern urban area. Over 900 social service and emergency management organizations were contacted to identify those prepared to deliver emergency services. 37 of these were emergency management organizations. (Survey questions can be found in appendix number 11). With questions measured on a four point scale, the average mean score was 2.7, with a standard deviation of .7. Gillespie, et al. (1987).

Community-based preparedness organizations can have a very positive effect on encouraging individual and neighborhood preparedness activity. These types of programs can increase feelings of social support, and can serve as a valuable source of immediate post disaster medical triage and

assistance. They can also serve as a model for a new approach to public versus private sector preparedness. An important similarity regarding community-based programs is that the development of the programs stemmed from the community. In most programs the initiating agents were concerned members of the community. In many instances private individuals and groups approached the local government for assistance. The groups and individuals sought the tools, techniques and knowledge that would assist citizens in a disaster. The desire was to be able to respond in one's own neighborhood, without relying solely on local government for assistance. Simpson, (2002). A partial list of fire departments and the disaster program names can be found in appendix number 12.

NFPA (2005), when William Timmons, the public education coordinator for New York's Ridge Road Fire District, was asked where firefighters should start in their disaster preparedness efforts, his quick answer was: "With the firefighters themselves." He noted that fire departments need to educate the public, but also need have to teach department members. For Timmons department, that means preparing to be without power for up to four or five days. Timmons also notes that "for firefighters on duty during a disaster, it may be days before they're able to get home." (p.5). He encourages his firefighters to have at least a week or two of supplies on hand, and an emergency supplies kit at work and at home. To make sure that he gets his message across, Timmons reaches out to spouses and significant others of the firefighters, by having them come in and take a preparedness class.

When reaching out to the community, The Saint Paul Minnesota, Department of Fire and Safety Services sought to provide disaster preparedness training to those of special needs. The deaf community in the Twin cities was selected. The department turned to organizations already providing services to this community. Paula Peterson, public education officer for the department stated, "It's a very well-organized community and they have the resources to provide sign language interpreters." "I let them do the organizing because as a community they are extremely well connected." (p.13). NFPA (2005).

In Brazos County, Texas, public education officer Cindy Giedraitis of the College Station Fire Department sent out a specific-needs survey to identify older adults and other residents who may require assistance or medical attention in a disaster. NFPA (2005).

In Bessemer Alabama, the Fire Department joined with a number of city and county agencies in an agreement to open a medical needs shelter. NFPA, (2005).

Some departments have solicited financial support from local businesses or major corporations to help fund disaster preparedness programs. Some items asked for were duplication of handouts, food and beverages for the presentation, items for emergency supplies kits, and door prizes. NFPA (2005).

In a study by Knudsen, Johnson, Ledlow, Barbisch & Binns (2007), a Community Preparedness Scorecard designed to establish an inventory of a community's resources was sent to 53 townships, with 31 responding. The best overall score was 100. The average overall score was 24. Results were as follows: Risk assessment, 5.7 (out of 30), prevention, deterrence, and planning, 15.8 (out of 30), training, awareness and application, 5 (out of 30), activation and response, 18.87 (out of 35), leadership, authority and communication, 15.7 (out of 35). Recommendations from the study were; to improve communication and education between townships and the county offices of emergency management, to expand the scope of the model in order to document previous experience with particular types of emergency events and natural disasters, and require community leaders to be familiar with FEMA's Guide for All-Hazard Emergency Operations Planning, State and Local Guide.

In summary, some fire departments have reached out to the communities through various training programs to better prepare the communities for disasters, and have provided training for individual department members. However, the study by Knudsen, et al., shows that still other departments need to do more in disseminating disaster information to the communities, and better preparing department personnel.

The U.S. Department of Justice & FEMA (n.d.) reminds all responding departments, that a disaster or emergency has the potential to cause substantial health and medical problems, with perhaps

hundreds or thousands of deaths and injuries. “Deaths and injuries will occur primarily from the collapse of manmade structures and collateral events, such as fire.” (p.c-11).

Young (2002) writes about a program named NOVA that provides entitled “Companioning.” These persons are trained in crises intervention techniques and methods of post-trauma counseling. Any concerned citizen can take this course. NOVA can be very helpful post disaster since studies by AAOS & WMS, (2005) showed that anxiety or panic may compromise safety and interfere with rescue and first aid. (p. 6)

FEMA, (2004) provides a program that; “trains volunteers to organize themselves and spontaneous volunteers at the disaster site, to provide immediate assistance to victims, and to collect disaster intelligence to support responders’ efforts when they arrive.” (p.2). This program is referred to as CERT.

According to the Department of Homeland Security (2005), some factors in reducing loss of life during and after a disaster are when preparedness organizations follow NIMS standards, and meet regularly. Training and exercises helps personal at all levels to improve hazard management capabilities, along with equipment acquisition and certification. Mutual aid should include; roles and responsibilities of individual parties, and notification procedures.

Homeland Security (2005) advises that it is vital for departments to be able to rapidly expand from Single Incident Command and multi-agency coordination systems, to Unified Command, to a National Response Plan.

To enhance efforts of planning for and managing an incident of national significance, the plan should provide for setting response priorities, integrating multiple entities and functions, establish collaborative relationships with other entities, ensure effective communication support, effectively allocate resources, and identify needed mutual aid. (p. PM 3-3). Homeland Security (2005).

In order not to waste precious time during and after a disaster, Homeland Security (2005) advises that it is essential; to understand the situation, establish objectives and strategies, develop the plan, prepare and disseminate the plan, and lastly, evaluate and revise the plan.

Regarding the benefits of an effective public information system, a well executed public information system effort will increase an organization's credibility by providing vital information to the public, displaying the organization's authority and capabilities, maintaining the organization's operations and mitigating losses, using the press to aid response and recovery management. (p. PM 5-3). Homeland Security (2005).

Redlener, (2006) informs that a mega disaster is a catastrophic, high-consequence event that (a) overwhelms or threatens to overwhelm local and regional response capacity, and (b) is caused by natural phenomenon, massive infrastructure failure, industrial accident, or malevolent intention.

Redlener, (2006) also noted that understanding and addressing key social and community issues before a disaster is essential. "All major disasters carry the potential for social discontent or disorder." (p. 40). For example, during Hurricane Katrina people were told to evacuate who had no cars, or money for other means of transportation. Therefore, "...the messages and messengers during a crisis should be consistent with the issues and culture specific to the neighborhoods and communities of the city." (p.40).

Indicators of capacity overload for a department include the inability to manage immediate rescue of endangered survivors, significant backlog of victims unable to get appropriate medical care or other essential support, inability to protect vital infrastructure or significant property damage, and uncontrolled social breakdown. (p. 134), Redlener, (2006).

DERA (2007) is a non-profit disaster organization that focuses on preparedness, response, and education. DERA helps disaster victims by improving planning, communications and logistics, reducing risks and mitigating hazards, conducting community preparedness programs, and by sponsoring emergency response missions.

DERA also sponsors school awards programs that encourage students to study the effects of disasters and to conduct projects that reduce local hazards and improve community preparedness, safety and environmental protection.

In order to reduce the potential loss of life and the negative impact on the community during a disaster, a department would first need to understand the social and economic issues in its community. Another key factor in reducing loss of life during and after a disaster is for a department to prevent and control panic among the community by enlisting such programs as CERT, Companioning and DERA.

The literature review has clearly shown a need for citizens to be better prepared for, and better informed about disaster preparedness. The review then went on to indicate that there is also a need for fire departments to provide information and training for citizens in a particular area.

PROCEDURES

A brief telephone interview was conducted by Maureen Martin, research assistant on Monday March 26, 2007 with Captain Douglas of the West Chester Fire Department, West Chester, OH regarding his department policy on disaster preparedness, and how this information gets disseminated to the community. He stated that his department did have a disaster preparedness plan that they considered confidential. He noted that the city's public education officer handles any questions from the community on disaster preparedness, and disseminates any brochures, pamphlets etc., that are requested. His department does not provide any classes for citizens to his knowledge. They also did not initiate communication with the community in any way to disseminate disaster preparedness information.

A telephone and door to door survey was conducted among a cross-section of citizens in the City of Blue Ash regarding disaster preparedness. An e-mail survey was conducted of 95 Fire Departments, and three non-fire department personnel represented by all current and past OFE students, questioning what, if anything, they have done regarding educating themselves and the public

on the subject of disaster preparedness. In one response, the department noted that after poor attendance at two CERT classes provided by the department, nothing further was attempted to assist the community in disaster preparedness.

Definition of Terms

Blood Borne. Microorganisms that are present in human blood that can cause disease in humans. (OSHA) Note: the term “blood” includes blood, blood components, and products made from human blood. (United States Fire Administration [USFA], 2002, page 133.)

Body Fluids. “Fluids that have been recognized by the CDC as directly linked to the transmission of HIV and/or HBV and/or to which Universal Precautions apply: blood, semen, blood products, vaginal secretions, cerebrospinal fluid, synovial fluid, pericardial fluid, amniotic fluid, and concentrated HIV or HBV viruses.” (OSHA) (United States Fire Administration [USFA], 2002, page 133.)

CERT. Community Emergency Response Team. (www.citizencorps.gov.)

CPR. Cardiopulmonary Resuscitation. A procedure designed to restore normal breathing after cardiac arrest that includes the clearance of air passages to the lungs, heart massage by the exertion of pressure on the chest, and the use of drugs. (Webster’s Ninth New Collegiate Dictionary, 1986)

DART. Disaster Action Response Team. (<http://intranet.library.arizona>)

DERA. Disaster Preparation and Emergency Response Association. (www.disasters.org)

DMAT. Disaster Medical Assistance Team. (www.dmat.org)

FEMA. Federal Emergency Management Agency. (www.fema.gov.)

Infrastructure. The underlying foundation or basic framework, (as of a system or organization). (Webster’s Ninth New Collegiate Dictionary, 1986)

Microorganisms. A living organism, usually visible only with a microscope, including bacteria, viruses, fungi, and parasites. (United States Fire Administration [USFA]. 2002 page 139).

Mutual Aid. An agreement between emergency responders. (www. wikipedia.org)

NFPA. National Fire Prevention Association. (Get Ready! 2005)

NIMS. National Incident Management System. (Homeland Security; Weapons of Mass Destruction: Incident Management/ Unified Command, 2005)

NOVA. National Organization for Victim Assistance. (www.trynova.org.)

PTSD. Post Traumatic Stress Disorder. An anxiety disorder that can develop after exposure to a terrifying event or ordeal in which grave physical harm occurred or was threatened.

Responder. One that responds. In this case, one who responds to an emergency situation. (Webster's Ninth New Collegiate Dictionary, 1986)

Risk Assessment. The appraisal of probability of loss. (Webster's Ninth New Collegiate Dictionary, 1986)

Shelter in Place. A safety procedure designed to help protect persons during a serious airborne hazardous material emergency by taking shelter inside ones home, work, school or other building until the danger has passed. (The Alliance for Chemical Safety, n.d.)

Subcutaneous. Beneath the skin. (Blakiston's Illustrated Pocket Medical Dictionary, second edition. 1960)

Limitations of the Study

A limitation of the study was receiving only 19 survey results out of a total of 98 sent to Fire Departments and OFE alumni.

RESULTS

Research Question number 1. What steps can be taken ahead of time to prepare for the collapse of basic infrastructure in the community for an extended period of time?

The results of this research question are listed in detail in Appendices numbered 3-8, with survey questions in Appendix number 2. In summery, the research showed that citizens need to get informed by learning what possible hazards exist in one's local community, and make a plan on how to respond to any disasters in one's area. It is also necessary to know how to evacuate and to have a family communication plan. It can be additionally beneficial to assemble a disaster supplies kit, and to store food and water. Citizens can help prepare themselves for a disaster by attending classes such as FEMA's "Are You Ready?" and NFPA's "Get Ready". Also available to citizens are disaster preparedness packets that can be obtained through The American Red Cross.

A door to door survey of Blue Ash Citizens was undertaken to find out in part; how important disaster preparedness is to them, if they currently have a disaster kit in their home, or a family disaster plan. Data was collected and processed. Blue Ash residents were randomly selected for the survey. Four neighborhoods were selected: Two that are located within two miles of the cities two fire stations'; two that are at the outskirts of the cities borders. These consisted of: One upscale neighborhood; one middle-class neighborhood; one underprivileged neighborhood and one apartment complex. This was discussed and determined by the writer of the paper and the research assistant to be a very good representation of the total population.

Although 50% of those surveyed said that disaster preparedness was of utmost importance to them, 85% did not have a disaster kit, and 75% had no family disaster plan.

Research Question number 2. How can the Blue Ash Fire Department direct the residents and individual fire department members to prepare for a catastrophic event?

See survey questions in Appendix number 2. Research revealed that the Blue Ash Fire Department can have a part in preparing citizens in the community for local disasters by surveying the community, and implementing and providing classes provided through FEMA, NFPA and The

American Red Cross. Department members can be better prepared by synchronizing emergency responders and community leaders through joint planning sessions.

In the Citizen survey previously mentioned, the answers to the last two questions revealed that 58% of those surveyed would attend disaster preparedness classes if provided through the Blue Ash Fire Department, and 52% would be interested in participating in a mock disaster drill for the purpose of training.

Research Question number 3. What have other fire departments done to direct the residents and individual fire department members in this regard?

Based on the literature reviewed and survey questions, some fire departments have reached out to the communities through various training programs such as CERT, DERA, FEMA's "Are You Ready?", NFPA's "Get Ready", and NOVA's "Companioning" to better prepare the communities for disasters. However, as survey results and the study by Gillespie, et al., show, some departments still do not provide such training for citizens. Studies and the survey showed that most departments have provided training for individual department members.

Ninety five fire departments and three non-fire department personnel were surveyed by e-mail, with 19 responding. (Survey questions in Appendix number 1.) Of those responding departments, 16 departments have prepared their staff for a disaster. Fourteen have a written disaster plan, and 13 have both training, and synchronized plans with other departments and schools. Eleven departments have done something to prepare citizens for a disaster; of these 11 departments, 3 have provided classes from FEMA's "Are You Ready?", and 3 departments provided classes from NFPA's "Get Ready?" All 11 departments have provided FEMA's CERT program. Ten departments provide citizens with material on disaster preparedness from The American Red Cross. Only one department had ever surveyed citizens in the local community to see if they are prepared for various disasters.

Research Question number 4. During and after such an event, what steps can be taken to reduce the potential loss of life and the negative impact on the community?

See details in Appendices numbered 9 and 10. Research revealed that in order to reduce the potential loss of life and the negative impact on the community during a disaster, a department would first need to understand the social and economic issues in its community. A key factor in reducing loss of life during and after a disaster is for departments to attempt to prevent and control panic among the community by enlisting such programs as CERT, Companionship, and DERA. As noted in the Appendix, The American Red Cross also has provided information for Emergency Departments when dealing with loss of life, and the aftermath of disasters.

DISCUSSION

A local survey and the literature review revealed that not many citizens appear to be prepared for a disaster. Most stated in the survey that although they thought disaster preparedness was important, few seemed to have disaster kits and family disaster plans. According to Redlener, (2006) "...few Americans have complied with recommendations made by a number of organizations promoting basic, prudent steps to ensure their safety in the event of a mega disaster." (p. 181). Comprehensive surveys that covered a number of issues, from concerns about further attacks, to how confident people were that government agencies could respond to disasters in general, were developed. Some of the most common responses to the survey were; 1). "It's not very likely that anything will really happen, and if it does, it won't happen to me." 2). "I'll just call 911." and 3). "I don't know what to do."

Through telephone interviews, and e-mail surveys it appeared that many fire departments were working to prepare citizens for disasters by providing classes and materials from The American Red Cross, FEMA, and NFPA.

Some departments while having disaster plans internally, and having disaster preparedness information on hand, failed in disseminating the information to the citizens in their community. This is in harmony with the study by Knudson et al. (2007) when a Community Preparedness Scorecard designed to establish an inventory of a community's resources was sent to 53 townships, 31 responded. With a total possible score of 100 in good community preparedness for a disaster, the average score was only 24. Recommendations from the afore mentioned study were; to improve communication and education between townships and county offices of emergency management, to expand the scope of the model in order to document previous experience with particular types of emergency events and natural disasters, and require community leaders to be familiar with FEMA's Guide for All-Hazard Emergency Operations Planning, State and Local Guide.

Survey results showed that fire departments can better prepare the local communities when informative surveys are utilized by the departments to obtain input on what citizens need in order to be better prepared for disasters.

Regarding reducing potential loss of life and negative impact on the community during and after a disaster, the Blue Ash Fire Department has done well; however steps can be taken to improve. More education is still needed to be provided to and disseminated to the public. FEMA, (2004) provides a program that; "trains volunteers to organize themselves and spontaneous volunteers at the disaster site, to provide immediate assistance to victims, and to collect disaster intelligence to support responders' efforts when they arrive." This program is referred to as CERT. FEMA'S (2004) "Are You Ready?" also provides a facilitators guide with a DVD to conduct a program to prepare the community for a disaster. "This guide is a companion to 'Are you Ready?' an in-depth guide to citizen preparedness. This document contains guidelines for making emergency preparedness presentations to the general public through organizations such as civic, religious, and senior citizen groups, volunteer agencies, as well as scouts, youth groups, and school districts." Offering DERA and NOVA's "companioning" program to citizens can be a vital aid in reducing the negative impact of a disaster.

RECOMMENDATIONS

The purpose of this study was to identify and describe the strategies and preparations the Blue Ash Fire Department and community members can make for the collapse of basic infrastructure during local disasters, therefore the recommendations are as follows:

- 1.) Collect data from sources such as FEMA, The American Red Cross, DERA, NFPA, and Homeland Security.
- 2.) Develop training programs such as FEMA's "Are You Ready?" An In-depth guide to Citizen Preparedness; NFPA's "Get Ready!"; The American Red Cross disaster preparedness packet; CERT, NOVA, DART and DERA classes.
- 3.) Mail out more surveys to the community to learn about special needs; i.e. the elderly, etc.
- 4.) Provide training programs on disaster preparedness for the community and inform the community of the availability of said classes through the monthly newsletter and the Blue Ash calendar that is sent to all Blue Ash citizens annually.
- 5.) Provide bi-annual classes at the Fire Department in CERT, NFPA's "Get Ready!" and or FEMA's "Are You Ready?" programs, and advertise this through the city's monthly newsletter and Blue Ash calendar.
- 6.) Look into funding options for disaster preparedness programs from local businesses.
- 7.) Community members need to implement disaster preparedness information through the use of disaster supplies kits, having family disaster plans, and participating in disaster preparedness programs provided for the community.

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APPENDIX 1 – SURVEY QUESTIONS SENT TO FIRE DEPARTMENTS

1) Has your department prepared their staff for a catastrophic event?

Yes ___ No ___. If yes, please check all of the following that apply.

a. A written disaster plan? Yes ___ No ___.

b. Training for a catastrophic event? Yes ___ No ___.

c. Have a synchronized plan with police, fire, emergency medical personnel and school administrators? Yes ___ No ___.

2) Does your department do anything to prepare the citizens for a catastrophic event?

Yes ___ No ___. If yes, please check all of the following that apply.

a. Provide classes for citizens such as:

FEMA's "Are You Ready?" Yes ___ No ___.

NFPA's "Get Ready?" Yes ___ No ___.

FEMA's CERT program Yes ___ No ___.

b. Provide materials from The American Red Cross on Disaster Preparedness?

Yes ___ No ___.

3) Have you surveyed the citizens to see if they are prepared for various disasters, such as whether they have a disaster kit, or know how to obtain one? Yes ___ No ___.

APPENDIX 2 – SURVEY QUESTIONS USED IN COMMUNITY SURVEY

- 1.) On a scale from one-ten, with ten being the most important, as a private citizen, how important is disaster preparedness to you?
- 2.) Do you currently have disaster kit in your home? I.E. A back pack with bottled water, non-perishable food, flashlight, first aid kit, battery powered radio, and an extra change of clothing? Yes___ No___.
- 3.) Do you currently have a family disaster plan? I.E. A meeting place for family members in case of a catastrophic event, family communication plan, utility shut off safety, etc.
Yes___ No___.
- 4.) Would you attend a disaster preparedness class or seminar if provided through your local fire department? Yes___ No___.
- 5.) Would you participate in a mock disaster drill for the purpose of training citizens if provided by your local fire department? Yes___ No___.

APPENDIX 3 – KEEPING WARM

The American Red Cross also tells us how to keep warm in a cold house if you cannot travel to a warm place.

They highlight the following points:

- Don't panic.
- Shut water off at the main valve, or open faucets so water can drip.
- Dress warmly.
- Eat.
- Wear a hat.
- Use several light-weight blankets.
- Check on neighbors.
- Keep a home emergency kit on hand.
 1. Flashlight/Batteries
 2. Portable radio/Batteries
 3. Three day supply of food and water, (One gallon of water per person per day)
 4. Thermal blanket.
 5. Plastic and duct tape, (for Shelter-In-Place)
 6. First aid kit
 7. Sanitation and hygiene items
 8. Extra clothing
 9. Cash
 10. Medications

APPENDIX 4 - POWER OUTAGES

The American Red Cross (2000), states during power outages, residents and businesses need to know what is needed and what to do. During a power outage the four major items needed are;

- cooler
- ice
- shelf-stable foods
- a thermometer

The three major things to do during a power outage are;

- do not open the refrigerator or freezer, if the outage may be longer than two-four hours
- pack perishables from the refrigerator in the cooler surrounded by ice

If the outage may be prolonged, pack items from the freezer into the cooler with ice.

NFPA (2005) suggests

Filling plastic containers with water, leaving about an inch of space in each, and putting them in the freezer. The frozen water will help keep food cool during an outage. Do not refreeze any dairy, seafood, or food that thawed completely, or been above 40 degrees for two or more hours. Back up computer files regularly. Keep your gas tank at least half full.

APPENDIX 5 - CARBON-MONOXIDE POISONING

The American Red Cross, (2002) notes “that carbon monoxide created by fuel-burning devices kills at least 200 people a year and sends more than 5,000 to hospital emergency rooms for treatment.” To protect yourself from CO poisoning, install a battery operated CO alarm in your home per specifications.

APPENDIX 6 - THUNDERSTORMS & LIGHTENING

. The American Red Cross suggest during thunderstorms to:

- Avoid showering or bathing.
- Use a corded telephone for emergencies only.
- Avoid standing near a tall isolated tree, or open field.
- Avoid anything metal; golf clubs, etc.

NFPA, (2005). If one feel ones hair stand on end, indicating that lightening is about to strike, squat low to the ground on the balls of your feet. Place hands over ears and head between knees. Lightning strike victims carry no electrical charge, therefore attend to immediately.

APPENDIX 7 - SHELTER-IN-PLACE

According to the Alliance for Chemical Safety, (n.d.) during a hazardous material emergency, it is vital for citizens to be aware of what is known as Shelter in Place. The goal of Shelter in Place is to prevent contaminated outside air from entering your home or other shelter for the duration of the incident.

APPENDIX 8 - TORNADOES

NFPA, (2005). If outside with no shelter, lie flat in a nearby ditch or depression and cover ones head with ones hands. Do not get under an overpass or bridge. Never try to outrun a tornado in an urban or congested area in a car or truck.

APPENDIX 9 - AFTER THE DISASTER

The American Red Cross (1995) provides a brochure entitled, After Disaster Strikes; How to recover financially from a natural disaster.

Some tips are as follows:

- Conduct an inventory.
- Reconstruct lost records.
- Notify creditors and employers.
- File an insurance claim.
- Obtain loans and grants.
- Avoid contractor rip-offs.
- Take a deep breath.

APPENDIX 10 - LOSS OF LIFE

Studies by the American Red Cross, (n.d.) indicate When dealing with loss of life and trauma as a result of the disaster, ARC makes these recommendations:

- Talk it out
- Ask for help when you need it, (if feelings are still strong and you are experiencing PTSD, or physical problems in four to six weeks).
- Listen to other people
- Be especially kind to others.
- Return to your usual routine.
- Do something that could help others-take a first aid or CPR class.

APPENDIX 11 - GILLESPIE, STREETER SURVEY

1. Does your organization have a specific emergency response plan to guide its operation in a disaster like the one described above (in the scenario)? Yes = 1 No = 0
2. If yes, how long has it been since the emergency response plan has reviewed and updated? Years _____ Months _____
3. During the past three years, how many different times has a representative of your organization participated in a training session related to disaster preparedness?

0 = 0	2 = 5 to 9
1 = 1 to 4	3 = 10 or more
4. During the past three years, how many different times has a representative of your organization participated in simulated disaster exercises?

0 = 0	2 = 2 to 3
1 = 1	3 = 4 or more
5. During the coming year, how often will a representative of your organization participate in a disaster response training session?

0 = 0	2 = 2
1 = 1	3 = 3 or more
6. During the coming year, how often will a representative of your organization participate in a field disaster exercise?

0 = 0	2 = 2
1 = 1	
7. Are you familiar with the meaning of the term "Integrated Emergency Management System?" Yes = 1 No = 0

APPENDIX 12 - SIMPSON: LIST of PROGRAMS

Department	Program
Alamada County	Neighborhood Emergency Team (NET)
Aptos/ La Selva Fire District	Community Emergency Response Team (CERT)
Belvedere/Tiburon/Tiburon Peninsula	Tiburon Peninsula Disaster Volunteer Training
Bethel Island	Neighborhood Emergency Response Team (NERT)
Burlingame	Burlingame Emergency Support Team (BEST)
Carmel Highlands	Carmel Highlands Emergency Response & Pre- Volunteers in Preparedness (CHERP)
City of Sunnyvale	Sunnyvale Neighborhoods Activity Prepare (SNAP)
Danville	Disaster Preparedness Training
Milpitas	Strategic Actions for Emergencies (SAFE)
Novato	Homeowners Emergency Action Response Team (HEART)
Oakland	Citizens of Oakland Respond to Emergencies (CORE)
Richmond	Richmond Emergency Action Community Teams (REACT)
Russian River Fire Dept.	River Area Flood Training (RAFT)
San Leandro	Partnership for Preparedness
San Ramon	Disaster Action Response Team (DART)

APPENDIX 13 - PHILLEPS, et al., SURVEY

Table 6

Emergency preparedness: a comparison of the lowest income quartile with the remainder of the sample

Question and responses: Lowest income quartile (%)

Remainder (%)

Would you participate in preparedness classes? w2 ¼ 20 (p ¼ 0.00)

Definitely yes 29.5 32.6

Probably yes 31.0 35.0

Maybe 18.8 17.3

Probably not 11.0 10.3

Definitely not 9.7 4.8

Received a CSEPP calendar? Yes. t ¼ 3.68 (p ¼ 0.00) 33.5 42.5

Able to hear warning siren from inside home? w2 ¼ 6 (p ¼ 0.05)

Yes, all the time 80.7 76.0

Sometimes 14.5 16.7

No, never 4.9 7.3

Have an emergency plan for family? Yes. t ¼ 5.27 (p ¼ 0.00) 11.9 22.3

Have an emergency preparedness kit? Yes. t ¼ 4.70 (p ¼ 0.00) 7.4 15.3

Times with no car available? w2 ¼ 27 (p ¼ 0.00)

Always 2.9 1.7

Frequently 5.1 2.6

Sometimes 9.5 4.6

Rarely 5.8 6.3

Never 76.8 84.7

Neighbor would help if car is unavailable? Yes. t ¼ 3.44 (p ¼ 0.00) 37.0 53.9

Times when children home alone? w2 ¼ 3.6 (p ¼ 0.30)

Frequently 7.4 5.9

Sometimes 12.8 13.5

Rarely 8.7 14.2

Never 71.1 66.4

Have arrangements if accident occurs while children are alone? Yes. t ¼ 0.85 (p ¼ 0.40)

30.2 37.1

Table 7

Intent to take protective actions: a comparison of the lowest income quartile with the remainder of the sample

Question and Responses Lowest Income Quartile (%)

Remainder (%)

If I learn of an accident, I would w2 ¼ 9.8 (p ¼ 0.00)

Act at once 50.7 58.5

Seek more information 49.3 41.5

To obtain more information, I would

Turn on local TV, t ¼ 2.98 (p ¼ 0.00) 89.8 81.9

See what neighbors are doing, t ¼ 3.26 (p ¼ 0.00) 47.7 36.2

Call relative or friends, t ¼ 2.64 (p ¼ 0.00) 59.5 49.9

If accident while children at school, I would w2 ¼ 7.7 (p ¼ 0.02)

Try to pick them up myself 76.8 70.0

Leave them in care of school 23.2 29.8

In the event of an accident, I will help my neighbors, w2 ¼ 11 (p ¼ 0.02)

Strongly agree 26.6 32.6

Agree 68.6 61.7

Disagree 3.1 3.3

Strongly disagree 0.2 1.1

If authorities advised evacuation, would you w2 ¼ 6 (p ¼ 0.18)

Definitely leave 85.1 85.3

Probably leave 12.1 13.0

Probably not leave 2.1 0.8

Definitely not leave 0.4 0.5

In case of evacuation, would you w2 ¼ 72 (p ¼ 0.00)

Stay in a motel/hotel 16.3 35.9

Stay with friends/relatives 59.3 50.1

Stay in a public shelter 24.4 14.1

If authorities advised using a community shelter, would you go? w2 ¼ 26 (p ¼ 0.00)

Definitely go 60.0 48.4

Probably go 29.9 34.0

Probably not go 5.7 9.6

Definitely not go 4.1 7.2

For some questions, responses of small numbers of undecided respondents have been omitted from the table, though not from the statistical analysis.